



TEST REPORT

Application No: ZR/2021/20040
Applicant: Wingtech Group (Hongkong) Limited
Address of Applicant: Flat/RM 1903 ,19/F, Podium Plaza, 5 Hanoi Road, Tsim Sha Tsui, Kowloon, Hongkong
Manufacturer: Wingtech Group (Hongkong) Limited
Address of Manufacturer: Flat/RM 1903 ,19/F, Podium Plaza, 5 Hanoi Road, Tsim Sha Tsui, Kowloon, Hongkong
EUT Description: AIRSPEED MOBILE HOTSPOT
Model No.: ASMHS01
Trade Mark: AIRSPEED MOBILE HOTSPOT
FCC ID: 2APXW-ASMHS01
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2021/3/1
Date of Test: 2021/3/1 to 2021/4/14
Date of Issue: 2021/4/27

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Simon Ling

Wireless Laboratory Manager



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Wireless Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021/4/27		Original

Authorized for issue by:	
Prepared By	 (Leah Chen) / Engineer
Checked By	 (Daniel Wang) /Reviewer



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Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

Internal Source	Upper Frequency
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5th harmonic of the highest frequency or 40GHz, whichever is lower



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Contents

1	GENERAL INFORMATION	5
1.1	DESCRIPTION OF SUPPORT UNITS	7
1.2	TEST LOCATION	7
1.3	TEST FACILITY	7
1.4	DEVIATION FROM STANDARDS	7
1.5	ABNORMALITIES FROM STANDARD CONDITIONS	7
2	EMISSION TEST RESULTS	8
2.1	CONDUCTED EMISSIONS AT MAINS TERMINALS (150kHz-30MHz)	8
2.1.1	E.U.T. Operation	8
2.1.2	Test Setup Procedures	9
2.1.3	Measurement Data	9
2.2	RADIATED EMISSIONS (30MHz-1GHz)	12
2.2.1	E.U.T. Operation	12
2.2.2	Test Setup Procedures	13
2.2.3	Measurement Data	13
2.3	RADIATED EMISSIONS (ABOVE 1GHz)	18
2.3.1	E.U.T. Operation	18
2.3.2	Test Setup Procedures	19
2.3.3	Measurement Data	19
3	EQUIPMENT LIST	22
4	MEASUREMENT UNCERTAINTY	24
5	PHOTOGRAPHS	25
5.1	TEST SETUP	25
5.2	EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	25



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1 General Information

Product Name:	AIRSPEED MOBILE HOTSPOT		
Model No.(EUT):	ASMHS01		
Trade Mark:	AIRSPEED MOBILE HOTSPOT		
Hardware Version:	DVT:89528_1_30		
Software Version:	Perdix_0.00.15		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	WCDMA Band II	1850~1910	1930~1990
	WCDMA Band V	824~849	869~894
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 66	1710~1780	2110~2200
	Wi-Fi 2.4G	2412~2462	2412~2462
	Wi-Fi 5G	5150~5850	5150~5850



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Accessory:

Adapter No.	Model No.	Manufacturer
1	PA-US5V2A-036	HUIZHOU PUAN ELECTRONICS CO.,LTD

Battery No.	Model No.	Manufacturer
1	MF01	Jiade Energy Technology(Zhuhai)Co.,Ltd.

Cable No.	Model No.	Manufacturer
1	HX-WT-31	HUIZHOU WASHIN ELECTRONICS CO.,LTD
2	8.2.77	ShenZhen BRL Technology Co., Ltd



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1.1 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	L480	REF. No.SEA1800
Mouse	Lenovo	3D optical Mouse	REF. No.:SEA2400
Router	NETGEAR	R6020	REF. No.SEA2200

1.2 Test Location

All tests were performed at:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Leah Chen,Ken Liu,Andy Yao

No tests were sub-contracted.

1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

Test Site No.:	SGS Xian Site No.	FCC Designation No.
	CO01-XA	03CH01-XA
		CN1271

1.4 Deviation from Standards

None

1.5 Abnormalities from Standard Conditions

None



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2 Emission Test Results

2.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 18.9 °C Humidity: 55.1 % RH Atmospheric Pressure: 1000 mbar

Pretest these modes to find the worst case:

- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: WCDMA Band V Idle + WLAN +playing MP4 (SD card) +battery1+Cable(worst)+adapter1
- d: LTE Band 5 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)
- e: LTE Band 12 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)
- f: LTE Band 13 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)

The worst case for final test: e: LTE Band 12 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)



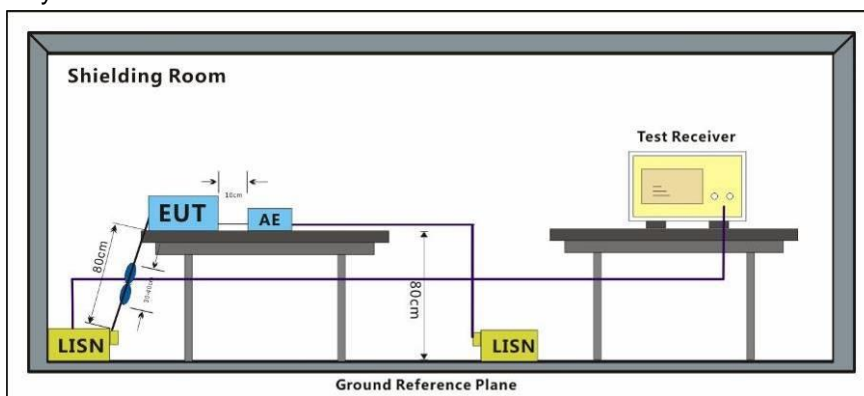
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2.1.2 Test Setup Procedures

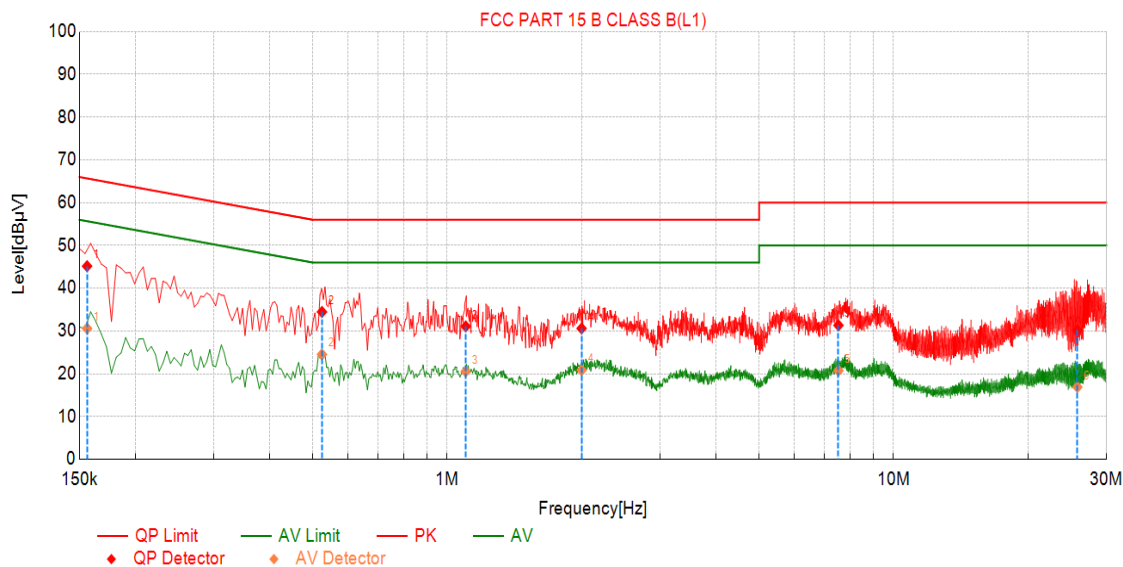
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.



2.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Mode:e; Line:Live Line



Test Graph

Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1561	45.15	65.67	20.52	30.59	55.67	25.08	PASS
2	0.5243	34.45	56.00	21.55	24.52	46.00	21.48	PASS
3	1.1006	31.07	56.00	24.93	20.51	46.00	25.49	PASS
4	2.0007	30.60	56.00	25.40	20.87	46.00	25.13	PASS
5	7.5269	31.32	60.00	28.68	20.74	50.00	29.26	PASS
6	25.8075	30.16	60.00	29.84	16.89	50.00	33.11	PASS



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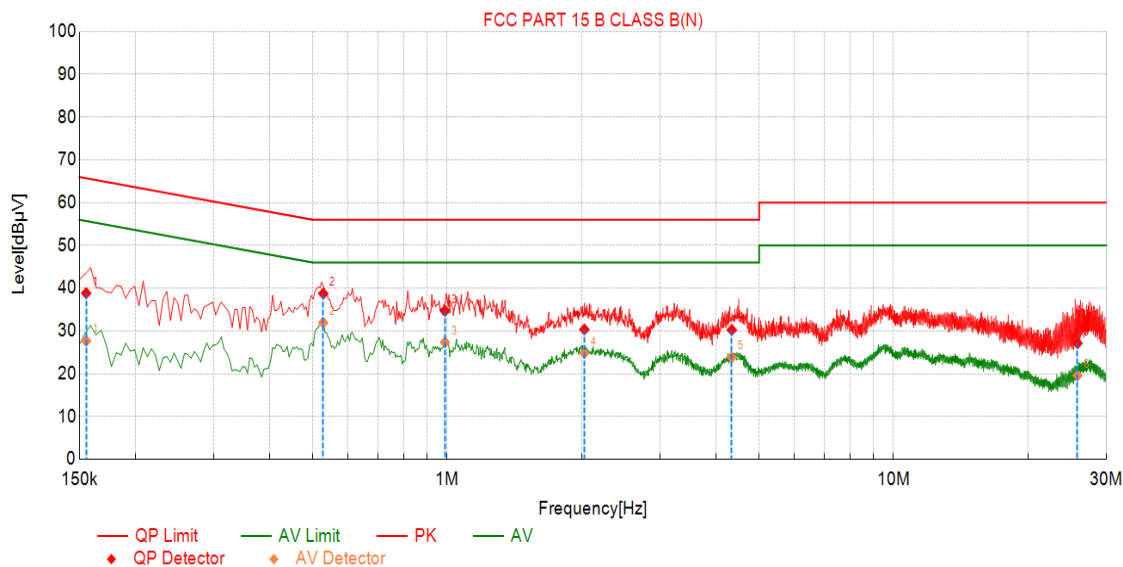
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Member of the SGS Group (SGS SA)

Mode:e; Line:Neutral Line



Test Graph

Final Data List

NO.	Freq. [MHz]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1554	38.84	65.71	26.87	27.68	55.71	28.03	PASS
2	0.5277	38.76	56.00	17.24	31.94	46.00	14.06	PASS
3	0.9886	34.69	56.00	21.31	27.36	46.00	18.64	PASS
4	2.0292	30.36	56.00	25.64	24.81	46.00	21.19	PASS
5	4.3413	30.25	56.00	25.75	23.84	46.00	22.16	PASS
6	25.8288	27.12	60.00	32.88	19.59	50.00	30.41	PASS



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2.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz -88MHz	40.0(dBμV/m) quasi-peak
88MHz-216MHz	43.5(dBμV/m) quasi-peak
216MHz-960MHz	46.0(dBμV/m) quasi-peak
960MHz-1000MHz	54.0(dBμV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

2.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 66.5 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:

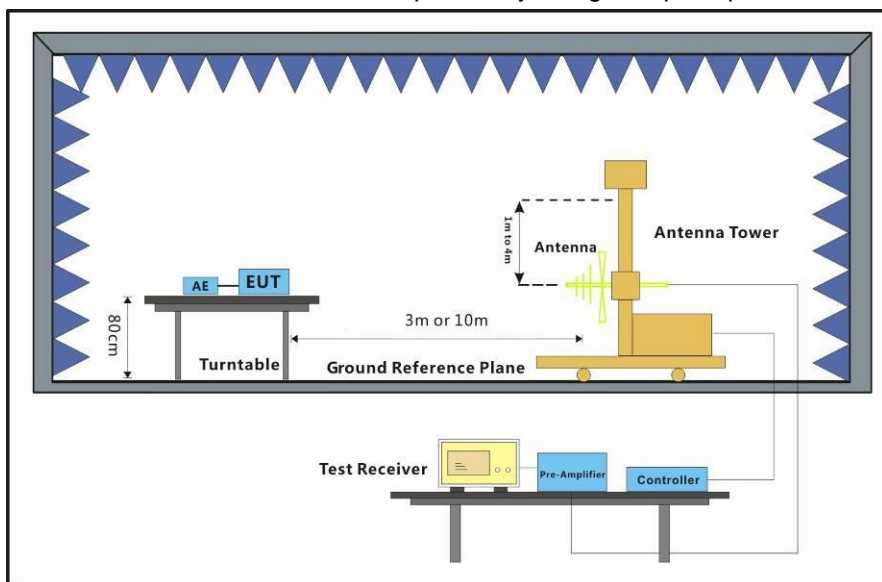
- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: WCDMA Band V Idle + WLAN +playing MP4 (SD card) +battery1+Cable(worst)+adapter1
- d: LTE Band 5 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)
- e: LTE Band 12 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)
- f: LTE Band 13 Idle + WLAN + playing MP4 (SD card) +battery(worst)+Cable(worst)+adapter(worst)

The worst case for final test: a: Transfer data between the EUT and the PC+USB cable1



2.2.2 Test Setup Procedures

1. The EUT was placed in a semi Anechoic Chamber as show below
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between 1 to 4 meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.
7. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.

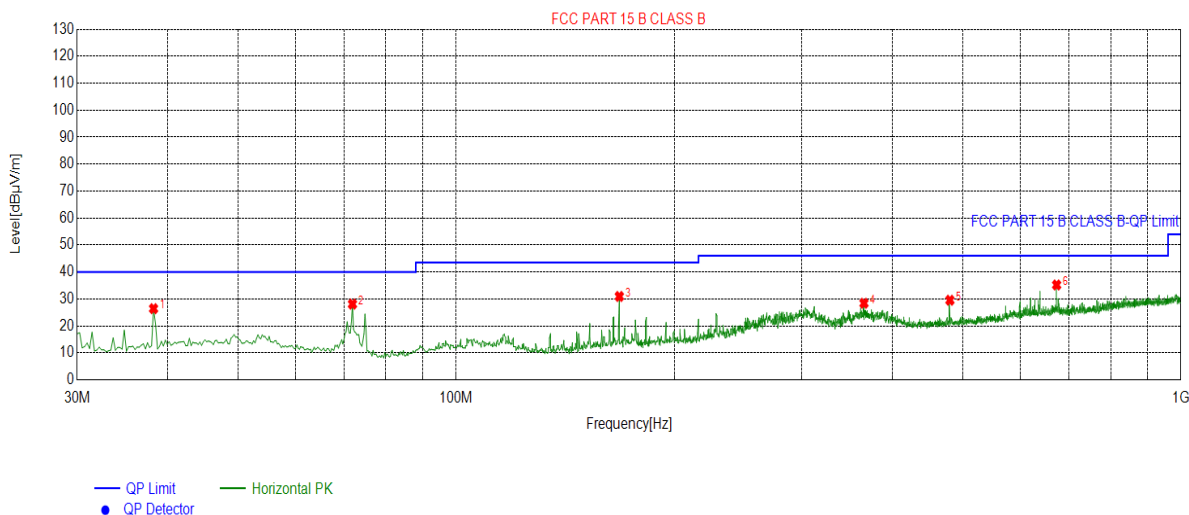


2.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.

Mode:a; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	38.2450	26.41	-29.54	40.00	13.59	200	349	Horizontal
2	71.9525	28.09	-32.98	40.00	11.91	300	6	Horizontal
3	167.982	30.93	-32.13	43.50	12.57	200	358	Horizontal
4	365.377	28.40	-24.42	46.00	17.60	100	59	Horizontal
5	480.080	29.53	-21.50	46.00	16.47	200	328	Horizontal
6	673.837	35.20	-17.37	46.00	10.80	100	33	Horizontal

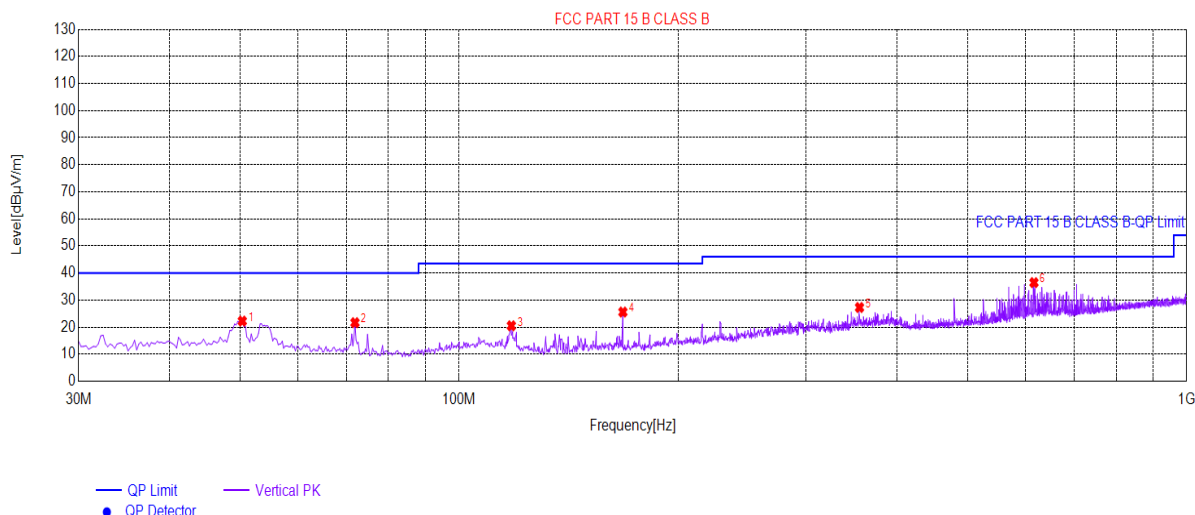


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Mode:a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	50.3700	22.24	-28.38	40.00	17.76	100	317	Vertical
2	71.9525	21.65	-32.98	40.00	18.35	200	118	Vertical
3	118.027	20.51	-30.87	43.50	22.99	100	242	Vertical
4	167.982	25.58	-32.13	43.50	17.92	100	47	Vertical
5	355.192	27.27	-24.44	46.00	18.73	100	26	Vertical
6	616.850	36.46	-18.42	46.00	9.54	100	158	Vertical



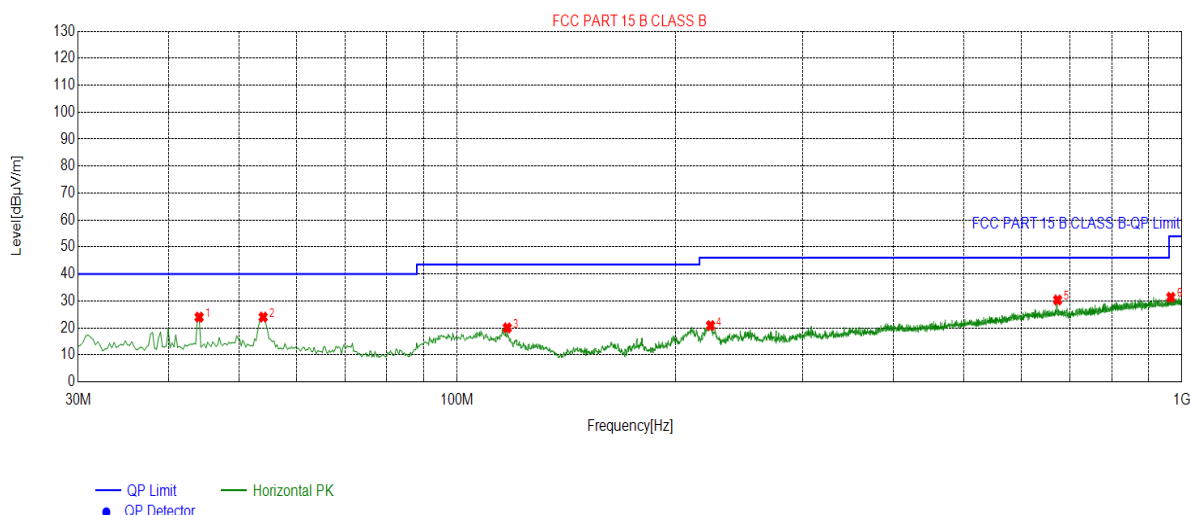
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Mode;; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.0650	24.00	-28.33	40.00	16.00	100	69	Horizontal
2	54.0075	24.02	-29.01	40.00	15.98	200	253	Horizontal
3	117.300	20.04	-30.73	43.50	23.46	300	27	Horizontal
4	223.757	20.87	-28.26	46.00	25.13	100	12	Horizontal
5	673.837	30.36	-17.37	46.00	15.64	200	269	Horizontal
6	965.565	31.37	-13.49	54.00	22.63	200	328	Horizontal



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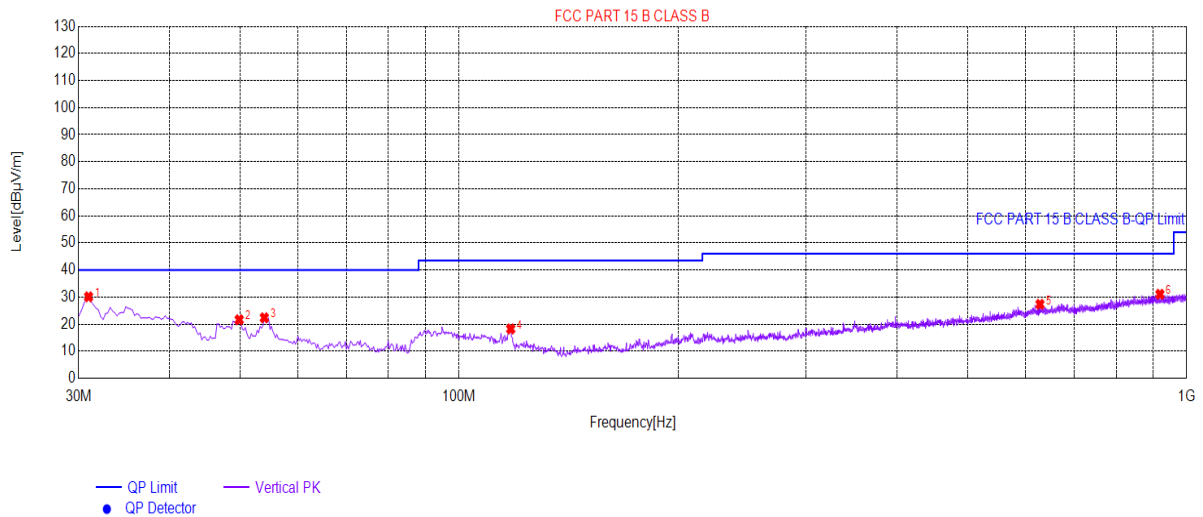


SGS-CSTC STANDARDS TECHNICAL SERVICES (XI'AN) CO., LTD.

Report No.: XZR/2021/2004001

Page: 17 of 25

Mode:; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9700	30.11	-30.82	40.00	9.89	100	358	Vertical
2	49.8850	21.63	-28.32	40.00	18.37	100	343	Vertical
3	54.0075	22.36	-29.01	40.00	17.64	100	196	Vertical
4	117.785	18.25	-30.82	43.50	25.25	100	301	Vertical
5	628.732	27.33	-18.22	46.00	18.67	100	322	Vertical
6	919.005	31.05	-14.02	46.00	14.95	100	338	Vertical



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2.3 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B
Test Method: ANSI C63.4:2014
Frequency Range: Above 1GHz
Measurement Distance: 3m
Limit:
Above 1GHz 74(dBμV/m) peak, 54(dBμV/m) average
Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C Humidity: 56.4 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:

- a: Transfer data between the EUT and the PC+USB cable1
- b: Transfer data between the EUT and the PC+USB cable2
- c: WCDMA Band V Idle + WLAN +playing MP4 (SD card) +battery1+Cable(worst)+adapter1
- d: LTE Band 5 Idle + WLAN + playing MP4 (SD card) +battery(worst)+ Cable(worst)+adapter(worst)
- e: LTE Band 12 Idle + WLAN + playing MP4 (SD card) +battery(worst)+ Cable(worst)+adapter(worst)
- f: LTE Band 13 Idle + WLAN + playing MP4 (SD card) +battery(worst)+ Cable(worst)+adapter(worst)

The worst case for final test: c: WCDMA Band V Idle + WLAN +playing MP4 (SD card) +battery1+Cable(worst)+adapter1



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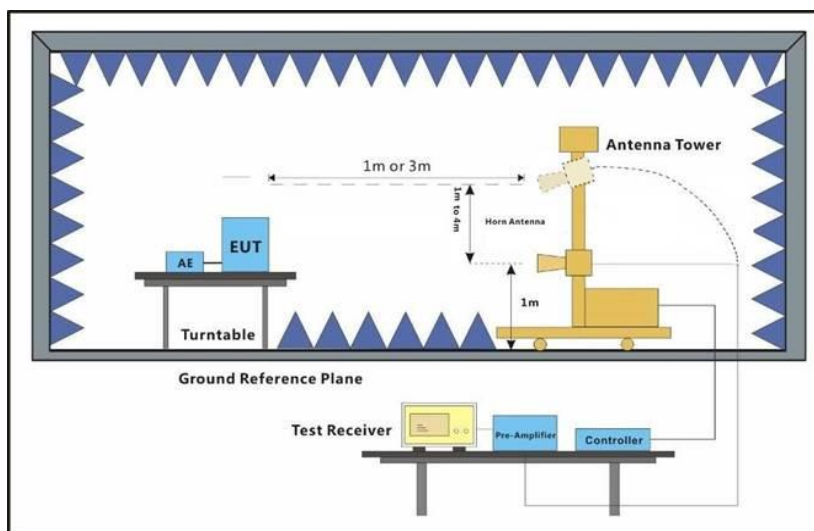
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2.3.2 Test Setup Procedures

1. The EUT was placed in a full Anechoic Chamber as show below
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between 1 to 4 meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak and AV Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.



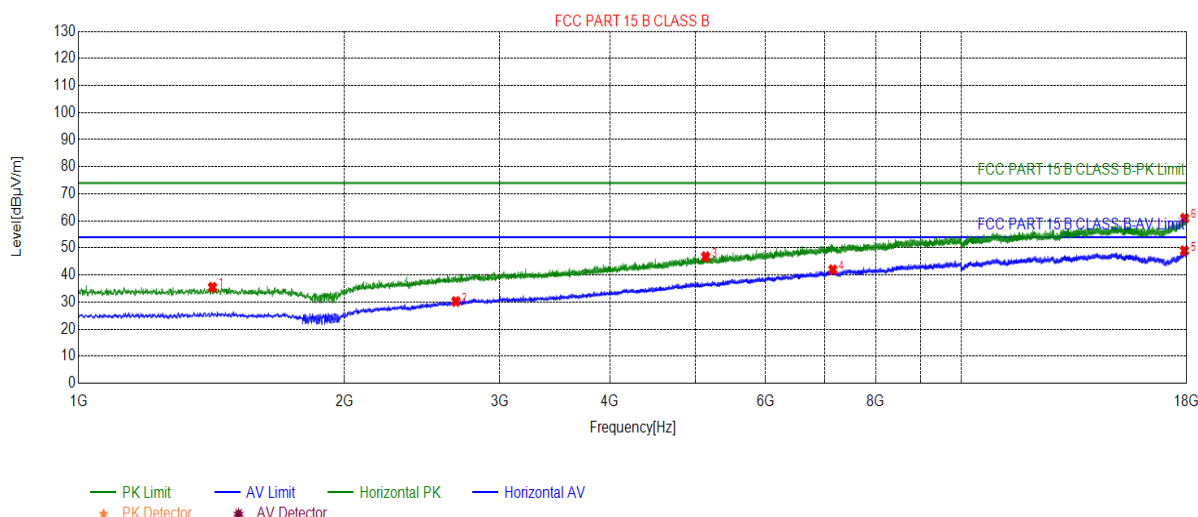
2.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.

Scan from 1GHz to 30GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed.

Mode:c; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1418.22	35.47	-29.03	74.00	38.53	121	32	Horizontal
2	2675.43	30.22	-23.97	54.00	23.78	121	280	Horizontal
3	5132.90	46.75	-14.51	74.00	27.25	121	306	Horizontal
4	7153.45	41.95	-8.74	54.00	12.05	121	110	Horizontal
5	17897.1	48.98	4.33	54.00	5.02	121	240	Horizontal
6	17903.9	60.95	4.35	74.00	13.05	121	77	Horizontal

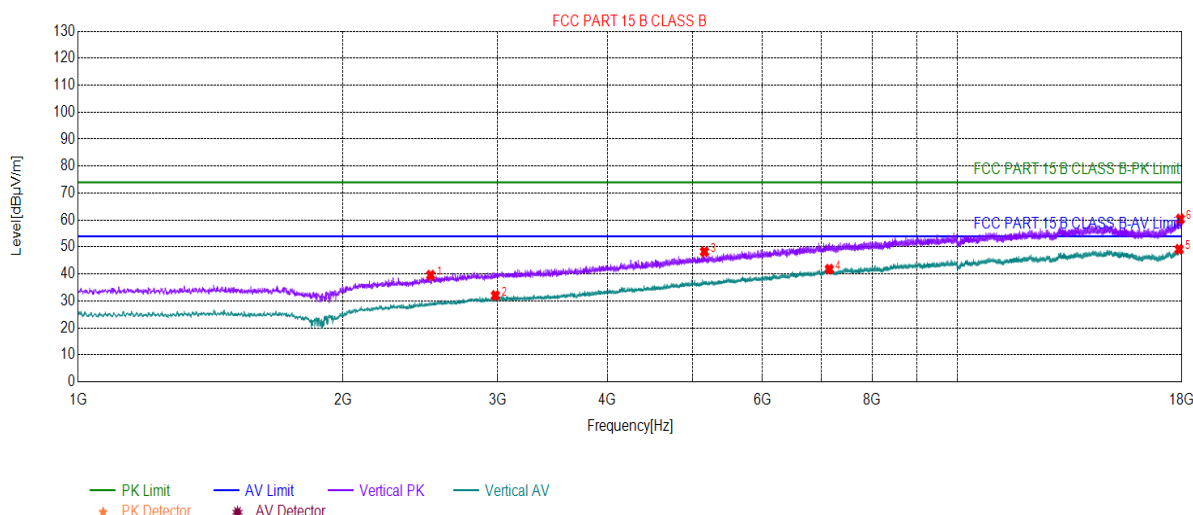


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Mode:c; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2517.32	39.53	-24.80	74.00	34.47	301	214	Vertical
2	2982.29	32.01	-22.53	54.00	21.99	213	209	Vertical
3	5155.85	48.26	-14.34	74.00	25.74	301	155	Vertical
4	7150.05	41.77	-8.76	54.00	12.23	213	253	Vertical
5	17870.7	49.15	3.50	54.00	4.85	301	312	Vertical
6	17924.3	60.38	4.00	74.00	13.62	301	110	Vertical



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3 Equipment List

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
5G UXM	Keysight	E7515B	XAW01-19-02	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR



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RE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020-04-02	2021-04-01
				2021-04-01	2022-03-31
Spectrum Analyzer	Keysight	N9020B	XAW01-11-03	2020-04-15	2021-04-14
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2021-04-01	2022-03-31
				2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25
5G UXM	Keysight	E7515B	XAW01-04-01	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ RE V3.0.0.2	XAW02-05-01	NCR	NCR



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4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.8\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 6GHz)
		$\pm 4.5\text{dB}$ (6GHz to 18GHz)
		$\pm 5.02\text{dB}$ (Above 18GHz)



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5 Photographs

5.1 Test Setup

Refer to Appendix A Setup Photos.

5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -



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